Subject: **North Bay Wetland Restoration and Enhancement Projects Map**
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Map Edition: **First**

Introduction

Tidal and nontidal wetland restoration has been ongoing for decades in the North Bay. Early projects were comparatively small and often were mitigation projects. Recent projects are comparatively large and in many cases are agency- and non-profit-sponsored restoration efforts to promote recovery of the Estuary's wetland-dependent fish and wildlife resources.

We have compiled an inventory of completed and pending North Bay tidal and nontidal wetland restoration and enhancement projects within the historic margins of tidal influence. We have mapped these projects based on the EcoAtlas GIS and prepared an accompanying database providing basic information on each project (name, sponsorship, size, type, and status). A number of other project tracking databases exist (e.g., San Francisco Bay Joint Venture, San Francisco Bay Regional Water Quality Control Board, San Francisco Estuary Project) that provide more extensive project information about many sites included in this map.

This inventory and map provides a framework for evaluating the status and effects of regional efforts to manage and restore tidal and nontidal wetlands to benefit of plant, fish and wildlife species. It shows the spatial relationship between completed, planned, and existing wetland areas and it identifies diked baylands in private ownership that could be restored and also could be subject to development.

Uses of this inventory include site selection for regional monitoring efforts and scientific research and identification of parcels for acquisition and restoration.

We classified wetlands into three groups based on their hydrologic regime: tidal, nontidal, and mixed. Presence or absence of full, unrestricted daily tidal exchange classifies sites as 'tidal.'

Sites without full exchange are 'nontidal' and have one or more hydrologic regimes:

- Muted tidal action (restricted daily tidal exchange)
- Managed tidal action (periodic tidal flooding and draining)
- Freshwater (rainfall and runoff)

Sites combining tidal marsh with any type of nontidal marsh are labeled 'mixed.' In all cases soil and water salinity will be present with levels varying widely within and between sites and seasonally.

A variety of organizations are currently planning approximately 18,000 acres of wetland restoration and enhancement projects in the North Bay. Of this total area, tidal marsh restoration represents about 14,000 acres and nontidal marsh the remaining 4,000 acres. These numbers continue to increase with ongoing land acquisition and restoration efforts. Another 1,500 acres of tidal marsh

and 3,500 acres of nontidal wetlands have been restored in the North Bay. The North Bay contains about 15,000 acres of existing tidal marshlands and 3,500 acres of existing nontidal wetlands managed by resource agencies and private entities or left unmanaged. About 23,000 acres are privately owned diked baylands largely in agricultural use.

The information necessary to prepare this map came from dozens of knowledgeable individuals and organizations in the San Francisco Estuary region (see complete list in map legend), reviewing existing wetland project databases, reviewing aerial photography (especially that packaged with the EcoAtlas and a 1996 NOAA regional data set), reviewing a variety of background project documentation, and from public comments received on the draft map shown at the October 2001 State of the Estuary Conference in San Francisco. From these data sources we have attempted to identify correct project boundaries, provide accurate summary information, and include as many projects as possible.

Disclaimer

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This map is based on the SFEI EcoAtlas version 1.50b4 CD, dated September 4, 1998. All disclaimers and limitations presented with that CD are by reference incorporated here. Specifically, the data and associated data files on this CD-ROM are provided 'as is' without warranty to their performance, merchantable state, or fitness for any particular purpose. The entire risk associated with the results and performances of these data is assumed by the user. This data is not for navigational purposes.

The project information presented on this CD-ROM originates from a variety of sources and as such can vary in its accuracy. Errors in mapping project boundaries, describing any mapped project, or including or excluding any given project should be brought to our attention at www.swampthing.org.

Credits

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Credit for use of these data must be attributed to Wetlands and Water Resources (2002) which prepared this map and the San Francisco Estuary Institute (1998) for the underlying EcoAtlas version 1.50b4 project basis. Visit www.swampthing.org and/or www.sfei.org on the Internet for more information.

Data source credit must be attributed to WWR and SFEI regardless of any changes to the layout. Cartographic attribution to WWR must be included on the layout as is, and must be included as source material to any layout which closely resembles the original. WWR will not be cited as the primary source, nor will WWR be held accountable for layouts that deviate from the original.

Directory Structure

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File Structure-The file named 'Directory Map.jpg' located in this folder describes each folder included on this CD-ROM.

Internet Availability

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The files contained on this CD-ROM will be made available for free download via the Internet later in 2002. See www.swampthing.org or www.sfei.org. In addition, SFEI may incorporate these GIS data as a data layer available within its on-line EcoAtlas interactive system expected for later in 2002.

About the ArcView Projects

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There are two ArcView projects in the 'GIS_Files' folder. One of them, 'AV_3D-Analyst-Version_North_Bay_Wetland_Projects_B-size.apr,' includes a hillshade grid, and thus requires ArcView's 3D Analyst to open the file (no other extensions are required). The other project, 'AV_Non3D-Analyst-Version_North_Bay_Wetland_Projects_B-size.apr' does not include the grid and requires no extensions. Both projects were created in ArcView 3.2 (Windows version from 1999).

All data paths are relative to the ArcView Project (APR) files. Thus, the file can be opened in any directory so long as files are left in the child folders of the APR folder and until the file is saved. Once the APR file is saved, it adds absolute paths into the file, so it cannot be moved again without changes to the paths within the APR file (i.e., replace paths to those data in the APR file using a text editor program). In any case, if the user wishes to copy the files and be able to make changes to the APR, we recommend copying the entire directory structure intact to the desired local folder.

Summary information about the project is provided in the Project Properties dialog in the APR files. Brief descriptions of each theme in the view are provided in the theme properties.

Theme legend files are located in the 'Legends' folder, and bear the name of the theme for which they are used. These legend files can be used to recreate the legend classification and color schemes for each theme, so long as the field names and values within the tables remain unchanged.

About the ArcView Project Layouts

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A completed project layout is included within each ArcView project file (APR). The layout is provided for users as a map template from which to work in creating custom maps with these data (the CD-ROM versions will of course serve as backups to preserve the original views and cartography). All text and non-shapefile symbols are attached to the theme they describe, for example the highway shields are attached to the highway theme, the text pointer boxes are attached to the themes they point to, etc. Thus, if the theme is turned off, the text or symbol disappears. The user should detach all graphics if they intend to remove shapefiles from the view, otherwise they will lose those graphics.

About Using the ArcView Project in Windows 98

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We have identified a minor software error when running ArcView 3.2 in Windows 98. The error creates a visual problem that can be fixed readily. When accessing a theme's attribute table while the View is maximized, some graphic elements from the View will overlay onto the attribute table, obscuring it. To eliminate this problem, toggle the attribute table window away from and back to

maximum size. We have not encountered this problem running ArcView in the Windows 2000 or XP environments.

About the ArcInfo ArcMap Project

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This file (ArcMap_North Bay Wetland Projects E-size.mxd) was created in ArcInfo 8.1, on Windows 2000. The data paths are relative to the folder system on the CD-ROM. The same files are being used in this file as in the ArcView project, and the layout is essentially identical, with the exception that the layout is E size (34 by 44 inches) instead of B size (11 by 17 inches). There is one item in the legend for which there is no data. This item, called 'Items for Legend' is being read by the map legend (we chose to combine multiple themes that do not exist in the database as one). Deleting this theme from the layout will cause that section of the legend to disappear.

In order that this large file will open and redraw more rapidly, we have set the original file on the CD-ROM to have all themes turned off upon opening. When using ArcMap with large files, we recommend turning on only the themes that are required for the task at hand. The Existing Wetlands & Baylands theme and the Hillshade grid are particularly slow to redraw. All themes can be turned on simultaneously by checking an unchecked theme while holding the 'Ctrl' key on your keyboard.

About the Data

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In addition to shapefiles, there are a couple of hillshade grids that are used in the ArcInfo (ArcMap) map and the 3D Analyst version of the ArcView map. The majority of the shapefiles and grids are based on the San Francisco Estuary Institute's EcoAtlas version 1.50b4 (SFEI 1998). WWR has edited many lines and polygons to fit our classification scheme and to conform to the latest available information pertaining to spatial and attribute accuracy.

All shapefiles have been indexed in the Shape field, to ensure maximum query and redraw speeds. Alteration to the shapefiles should be accompanied by re-indexing the shapefiles.

All included shapefiles and grids conform to the following projection: UTM, Zone 10N, NAD27, Units Meters (same as all EcoAtlas data). The AREA and Perimeter fields, which are standard fields for ESRI geographic datasets, contain measurements of the polygons in SQUARE METERS. See shapefile metadata attribute information for all other field definitions.

Complete metadata documentation, including contact information, is provided in HTML format for each individual shapefile in the metadata folder. There is a FAQ file that provides basic summary information and contact information for the less technical user, and a more in-depth file is included for the more advanced GIS user. Both files bear the name of the shapefile they describe. Included in the same folders as the shapefiles are the original .xml files, which are the metadata files created in ArcCatalog. These files can be edited using that software.

About the Map Export Images

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Two JPEG export files are included on this CD-ROM in the 'Map Images Files & Data Tables' directory, an E-size version (34 by 44 inches) and a B-size version (11 by 17 inches). The E-size JPEG was exported from ArcInfo 8.1 at 200 dpi, at 'best' output, and the B-size version was exported from ArcView to EPS at 350 dpi, then converted to 600 dpi JPEG using ArcPress. EPS format best preserves the patterns (e.g., cross-hatching) used in the layout. If you do not have ArcPress to convert an EPS you've exported, GSView is a cost-free program that can perform many of the same conversions as ArcPress, including postscript conversions. GSView can be downloaded from the Internet at http://www.cs.wisc.edu/~ghost/index.html, or http://www.cs.wisc.edu/~ghost/gsview/.